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(पहला पुनरीक्षण)

Indian Standard

PESTICIDE — PHORATE G ENCAPSULATED — SPECIFICATION

(First Revision)

First Reprint OCTOBER 1997

UDC 632.951 PHO

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

July 1995 **Price Group 2**

Pesticides Sectional Committee, FAD 1

FOREWORD

This Indian Standard (First Revision) was adopted by Bureau of Indian Standards after the draft finialized by Pesticides Sectional Committee had been approved by the Food and Agriculture Division Council.

Phorate G are used as soil and systemic insecticide for the control of insects, mites, and certain nematodes in agriculture.

This standard was first published in 1980. This revision incorporates amendments and modified method of test for determination of phorate content.

In the preparation of this standard due consideration has been given to the provisions of the *Insecticides Act,* 1968 and the Rules framed thereunder and *Standards of Weights and Measures (Packaged Commodities) Rules,* 1977. However, this standard is subject to the restrictions imposed under these, wherever applicable.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

PESTICIDE—PHORATE G ENCAPSULATED—SPECIFICATION

(First Revision)

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for phorate G, encapsulated.

2 REFERENCES

The following Indian Standards are necessary adjuncts to this standard :

IS No.	*Title*
460 (Part 1) : 1985	Specification for test sieves : Part 1 Wire cloth test sieves (*third revision*)
6940 : 1982	Methods of test for pesticides and their formulations (*first revision*)
7976 : 1976	Phorate, technical
8190 (Part 1) : 1988	Requirement for packing of pesticides : Part 1 Solid pesticides (*second revision*)
10627 : 1983	Methods for sampling of pesticide formulations

3 REQUIREMENTS

3.1 Constituents

The material shall consist of phorate, technical (conforming to IS 7976 : 1976) impregnated on suitable carrier(s) together with binder(s), stabilizer(s) and /or other formulants.

3.2 Physical

The material shall comply with the physical requirements specified in 3.2.1 to 3.2.5.

3.2.1 *Description*

The material shall consist of dry, free flowing granules, free from visible extraneous matter and dust except for the amount specified (*see* 3.2.3). It may contain added coloring matter.

3.2.2 *Sieving Requirement*

Not less than 97 percent by mass of the material shall pass through a test sieve having a mesh size of the upper declared limit and not more than 5 percent by mass of the material shall pass through a test sieve having mesh size of lower declared limit when determined by the method described in 12.1 of IS 6940 : 1982.

3.2.2.1 The ratio of lower to upper sieve sizes declared under 3.2.2 shall not exceed 1 : 3.

3.2.3 *Dust*

When tested by the method prescribed in 12.1 of IS 6940 : 1982, not more than 1 percent by mass of the material shall pass through 75-micron IS Sieve [*see* IS 460 (Part 1) : 1985]. The material retained on the sieve shall also comply with the requirements of 3.3.1.

3.2.4 *Encapsulation*

3.2.4.1 When the material is subjected to the attrition test as prescribed in Annex A, the remnants shall not contain more than 2 percent by mass of declared nominal active ingredient.

3.2.4.2 When the material is subjected to the water run-off test as described in Annex B, the active ingredient in the water shall not exceed 5 percent by mass of the declared nominal active ingredient.

3.2.5 *Moisture Content*

When tested by the method prescribed in 4 of IS 6940 : 1982, the moisture content of the material shall not exceed 4 percent by mass.

3.3 Chemical

The material shall comply with the chemical requirements specified in 3.3.1 and 3.3.2.

3.3.1 *Phorate Content*

Phorate content shall be declared. When tested by the method prescribed in Annex C, the observed phorate content percent (m/m) of any of the samples shall not differ from the declared nominal value by more than the tolerance applied to the declared nominal value as given below (*see* 6.1 also).

Nominal value, percent	*Tolerance limits, percent (m/m)*
Up to 9	+10 −5
Above 9 and below 50	±5
50 and above	+ 5 − 3

3.3.2 *Acidity*

When tested by the method prescribed in **11.3** of IS 6940 : 1982 the acidity (as H_2SO_4), of the material shall be not more than 0.5 percent by mass.

4 PACKING

The material shall be packed as per requirements given in IS 8190 (Part 1) : 1988.

5 MARKING

5.1 The containers shall bear legibly and indelibly the following information:

a) Name of the material ;
b) Name of the manufacturer ;
c) Sieve size (*see* **3.2.2.**) ;
d) Batch number ;
e) Date of manufacture ;
f) Date of expiry date ;
g) Net mass in Kg ;
h) Phorate content, percent (m/m), nominal ; and
j) Any other information required under the *Insecticides Act and Rules and Standards of Weights and Measures (Packaged Commodities) Rules* 1977.

5.2 BIS Certification Mark

The containers may also be marked with the Standard Mark.

5.2.1 The use of the Standard Mark is goverened by the provisions of Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

6 SAMPLING

6.1 When bulk manufactured material is offered for inspection, representative samples of the material shall be drawn and tested as prescribed in IS 10627 : 1983 with in 90 days of its manufacture. The criteria for conformity shall be as given in IS 10627 : 1983. When the material is offered for inspection after 90 days of its manufacture, sampling shall be done as prescribed in IS 10627 : 1983. However, the criteria for conformity of the material shall be the limits of tolerances given under **3.3.1** of this standard.

ANNEX A

(*Clause* 3.2.4.1)

METHOD FOR ATTRITION TEST

A-1 Take 100 g of the material and sieve it for 2 hours in 75-micron IS sieve [*see* IS 460 (Part 1) : 1985] in a ro-tap machine.

A-2 Collect the remnants and determine its active ingredient as described in Annex C.

ANNEX B

(*Clause* 3.2.4.2)

METHOD FOR WATER RUN-OFF TEST

B-1 Take 10 g of the material in a 100 ml capacity burette plugged with cotton/glass wool at the bottom and add 50 ml water. Keep it for 15 minutes. Drain off the water after 15 minutes.

B-2 Determine active ingredient in the drained water so collected (*see* **B-1**) by the method described in Annex C.

ANNEX C

(*Clause* 3.3.1)

DETERMINATION OF PHORATE CONTENT

C-0 PRINCIPLE

C-0.1 Phorate is hydrolyzed in slightly aqueous acid in the presence of standard silver nitrate solution. The hydrolyzed product consume two moles of silver. The excess silver is titrated with standard ammounium thiocyanate solution. A correction for the amount of standard silver nitrate solution consumed by impurities present before hydrolysis is applied. Total silver consumed gives a measure of the active ingredient content.

C-1 REAGENTS

C-1.1 Acetone

C-1.2 Nitric Acid — concentrated.

C-1.3 Nitrobenzene

C-1.4 Ferric Nitrate Solution — 10 percent.

C-1.5 Standard Silver Nitrate Solution — 0.1 N.

C-1.6 Standard ammonium Thiocyanate Solution — 0.1 N.

C-1.7 Standard Potassium Hydroxide Solution — 0.1 N, aqueous in 10 percent potassium nitrate.

C-1.8 Congo Red Test Paper

C-1.9 Benzene

C-2 PROCEDURE

C-2.1 Weigh 25 g of the sample and transfer the same to 250-ml iodine flask. Add 150 ml of acetone and shake well for 20 minutes. Filter the extract into a 250-ml volumetric flask. Add 50 ml of acetone in the iodine flask and shake for 15 minutes. Filter the extract in the same volumentric flask through the cotton plug. Repeat this treatment with 40 ml of acetone and transfer the extract into the same volumetric flask. Make up the volume with acetone and mix well.

C-2.1.1 Place 150 ml water, 5 drops of concentrated nitric acid and exactly 50 ml of standard silver nitrate solution into a 500-ml iodine flask. Immerse in a water-bath maintained at 50°C until a constant temperature is attained. Pipette 50 ml of diluted sample (**C-2.1**) into iodine flask kept in water-bath; swirling the later during addition. Stopper and allow to remain in the 50°C water-bath for 15 minutes and cool to room temperature. Add 5 ml nitrobenzene, stopper tightly and shake vigorously for about one minute. Add 1 ml of ferric nitrate solution, shake for a minute and titrate against standard ammonium thiocyanate solution. As the end point is approached, the solution will assume a light salmon-pink colour. Stopper and shake vigorously. The solution colour will disappear. Add more of the titrant and again shake. Repeat this process until the colour is not completely discharged on shaking, but avaoid adding excess of the titrant. When a little colour remains, remove the same by addition of a drop or two of standard silver nitrate solution. At this point, one additional drop of standard ammonium thiocyanate solution should reproduce the faint salmon-pink colour indicating end point for the titration.

C-2.2 Determination of Impurities

Take 50 ml of diluted solution (**C-2.1**) in a 500-ml separatory funnel containing 150-ml of benzene; extract the benzene solution thrice successively by shaking each time with 50 ml potassium hydroxide (*see* **C-1.7**) followed by 50 ml water, collecting the combined aqueous layers. Add nitric acid till acidic to congo red paper, which will turn blue. Add 5 drops of acid in excess, then add exactly 5 ml of standard silver nitrate, 5 ml of nitrobenzene and shake vigously for about one minute. Add 1 ml of 10 percent ferric nitrate solution, shake for a minute and titrate with standard ammonium thiocyanate as described in **C-2.1.1**.

C-2.3 Calculation

C-2.3.1 Phorate content, percent by mass =

$$\left(\frac{65.10 \times (V_1 F_1 - V_2 F_2)}{M_1}\right) - \left(\frac{65.10 \times (v_1 F_1 - v_2 F_2)}{M_2}\right)$$

where,

V_1 = volume, in ml, of standard silver nitrate solution consumed;

F_1 = normality of standard silver nitrate solution;

V_2 = volume, in ml, of standard ammonium thiocyanate solution consumed;

F_2 = normality of standard ammonium thiocyanate solution;

M_1 = mass, in g, of the material taken for the test (*see* **C-2.1**);

v_1 = volume, in ml, of standard silver nitrate solution consumed for determination of impurities (**C-2.2**);

v_2 = volume, in ml, of standard ammonium thiocyanate solution consumed for determination of impurities (**C-2.2**); and

M_2 = mass, in g, of the material taken for determination of impurities (**C-2.2**).

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